***Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ TP: \_\_\_\_\_\_***

CW/HW #114: Application Trig Problems

Geometry – DUE Monday, March 9

**Cut to 4 pages; maybe add more inverse trig**

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| **CRS** | **FUN 502** Express sine, cosine, and tangent of an angle in a right triangle as a ratio of given side lengths; **FUN 602** Apply basic trigonometric ratios to solve right triangle problems. **G-SRT.8** Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. |
| **Objective** | 10.4 Write a ratio for sine, cosine, and tangent when side lengths are variables or number values given a figure, given a word problem, or given one of the side length ratios OR given the angle measure and one side length of a right triangle, find the side length of the triangle |

**For each problem below, follow these steps: (1) write down the given information on the picture or draw a sketch if needed, (2) circle what you’re looking for, (3) write what trig ratio or inverse ratio you’ll use, and (4) solve.**

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| 1. In right triangle ABC shown below, the tangent of ∠B is . What is the measure of ∠B? Round your answer to the nearest hundredth of a degree. | | | | 1. You lean a 16 foot ladder against the wall. If the ladder makes an angle of 70° with the ground, how far away from the wall is the base of the ladder? Round your answer to the nearest tenth of a foot. |
| 1. In the figure below, ABC is a right triangle with a right angle at C. Which of the statements about this figure is NOT correct?   A  B  C  10  6  8    A  B  C  10  6  8   1. sin A = 2. cos A = 3. cos B = 4. tan A = 5. tan B = | 1. In the figure below, ABC is a right triangle with a right angle at C. Find the measures of angles A & B using two different inverse trig functions. | | | |
| 1. An angle in a right triangle has a measure .  If tan =, then = ? | 1. An angle in a right triangle has a measure .  If tan =, then sin= ? | | | |
| ***What is different about the previous 2 questions?*** | | | | |
| 1. If in a right triangle  and ,   then x = ?    A. 1  B. 7  C. 12  D. 144  E. Cannot be determined from given information | | | 1. If in a right triangle  and ,   then ϴ = ?    A.  B.  C.  E. Cannot be determined from given information | |
| 1. The shadow of a telephone pole is 20 feet long. You measure the angle of elevation from the end of the shadow to the top of the telephone pole to be 70 degrees. Which of the following would give you the height of the pole?   A.  B.  C.  D.  E. | | 1. A wheelchair access ramp has measures 15 feet long across its diagnoal and reaches a height of 5 feet. Which of the following would give you the angle of the incline of the ramp? | | |
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| 1. In the right triangle shown below, what is the measure of angle A to the nearest degree?      1. 44 2. 46 3. 74 4. 90 5. Cannot be determined | 1. Two vertical poles, one 3 meters tall and the other 5 meters tall, stand a certain distance apart. A line from the top of the shorter pole to the top of the taller pole makes a 15 angle with a horizontal line. Which of the following expresses the horizontal distance, in meters, between the bases of the two poles (rounded to the nearest hundredth)?   A. 0.54  B. -7.46  C. 1.34  D. 0.13  E. 7.46 | |
| 1. (a)     (b) What is the measure of angle A? | 1. (a)     (b) What is the measure of angle A? | |
| 1. You have an extension ladder that you are using to repair a chimney. Which of the following is a trig ratio that could be used to find the length required for the extension ladder to reach a height of 14 ft for the chimney?  |  |  | | --- | --- | | A.  B.  C.  D.  E. |  | | 1. Find the perimeter of the triangle. Round to the nearest tenth.     A. 37.9 in  B. 57.4 in  C. 137.3 in  D. 161.8 in  E. 186.3 in | |
| 1. **Find the area of the largest triangle.** Round intermediate values to the nearest tenth. Use the rounded values to calculate the next value. Round your final answer to the nearest tenth. | | 1. **Find the perimeter of the larger triangle.** Round intermediate values to the nearest tenth. Use the rounded values to calculate the next value. Round your final answer to the nearest tenth. |
|  | | 1. Measuring the Length of a Lake From a stationary hot-air balloon 500 ft above the ground, two sightings of a lake are made (see figure). How long is the lake? |

**Solve the following word problems. For each question, draw a diagram to help you.**

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| 1. From a horizontal distance of 80.0 m, the angle of elevation to the top of a flagpole is 18°. Calculate the height of the flagpole to the nearest tenth of a meter. |
| 1. The angle of elevation of the sun is 68° when a tree casts a shadow 14.3 m long. How tall is the tree, to the nearest tenth of a meter? |
| 1. A person flying a kite has released 176 m of string. The string makes an angle of 27° with the   ground. How high is the kite? How far away is the kite horizontally? Answer to the nearest meter. |
| 1. An airplane is flying at an altitude of 6000 m over the ocean directly toward a coastline. At a certain   time, the angle of depression to the coastline from the airplane is 14°. How much farther (to the nearest kilometer) does the airplane have to fly before it is directly above the coastline?  1000 m = 1 km |
| 1. You are skiing on a mountain with an altitude of 1200 meters. The angle of depression is 21º. About how far do you ski down the mountain? |

**JOKES ON JOKES ON JOKES: “**Have you heard the one about the **geometer** who went to the beach to catch some **rays** and came back a **tangent?**” –Inspired by Sally Huang